

BARITE IN THE LASALLE LIMESTONE OF ILLINOIS*

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Many strata in the LaSalle limestone contain quartz, pyrite, and vugs of crystalline calcite in relative abundance. To date, however, the presence of barite has not been reported. This paper discusses and describes an occurrence of this mineral.

The barite was found in the upper part of the LaSalle limestone near the top of the limestone exposed in the abandoned LaSalle Stone Company quarry near LaSalle, in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 13, T.33 N. R.1 E. and also in another quarry adjacent on the west. The mineral is easily distinguished in hand specimens of the limestone by its light pink color. It occurs in small masses of thin blades, or sheets, which are easily separated with the fingernail.

The barite was identified by blow pipe and optical mineralogy techniques which were confirmed by x-ray analyses.¹ Indices of refraction check well with those commonly reported for barite. A series of specific gravity determinations with a Jolly balance averaged 4.151. This value is lower than the commonly reported gravity, but may be due to porosity resulting from the bladed character of the mineral.

Figure 1 shows a broken surface through the interior of a calcite- and barite-filled cavity. The light area in the center is the barite. Surrounding the barite is a zone of coarsely crystalline dark calcite

which owes its color to a very thin coating, believed to be ferruginous. The triangular shape of many of the grains results from the exposure of only three faces of rhombic crystals. Some dark calcite grains are also evident adhering to the main body of the barite.

Figure 2 is another cavity which has been sawed, smoothed and etched with hydrochloric acid to bring the barite into relief. The white-appearing barite in the center of the figure is partially surrounded by dark, coarsely crystalline calcite which blends into more finely crystalline clear calcite. The outline of the barite, however, is well defined and conforms to the outline of the coarse calcite crystals. The mottled area in the lower right-hand portion of the photograph is limestone matrix.

Figure 3 is a thin section of a portion of a filled cavity. The cavity wall shown in the figure is part of a fossil or fossils. Just inside the cavity wall in the upper right a very thin zone of fine calcite is indistinctly visible. Radiating from the finely crystalline calcite is a layer of coarse calcite. A large calcite crystal is visible in the lower left of the photograph. The barite fills the space within the coarse calcite zone, and does not show crystal boundaries, but is in part characterized by a lack of evident crystallinity and faint striations running from upper left to lower right which result from its bladed structure. The conforming

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¹Bradley, W. F., personal communication, 1951.

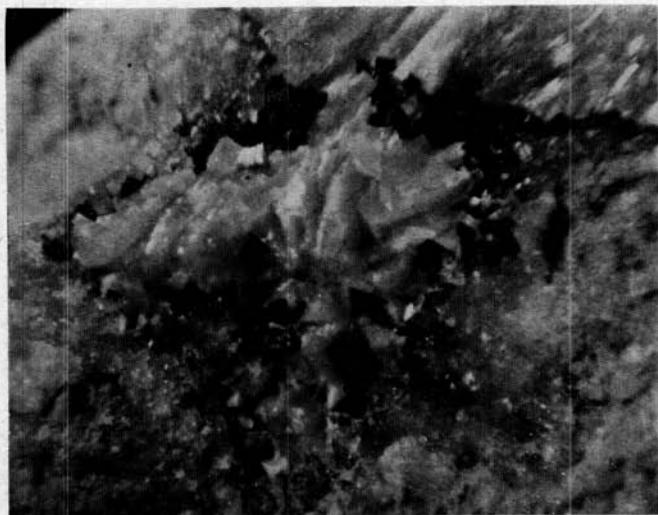


FIG. 1.—Broken surface of a small cavity filled with barite and lined with dark calcite. X 10.

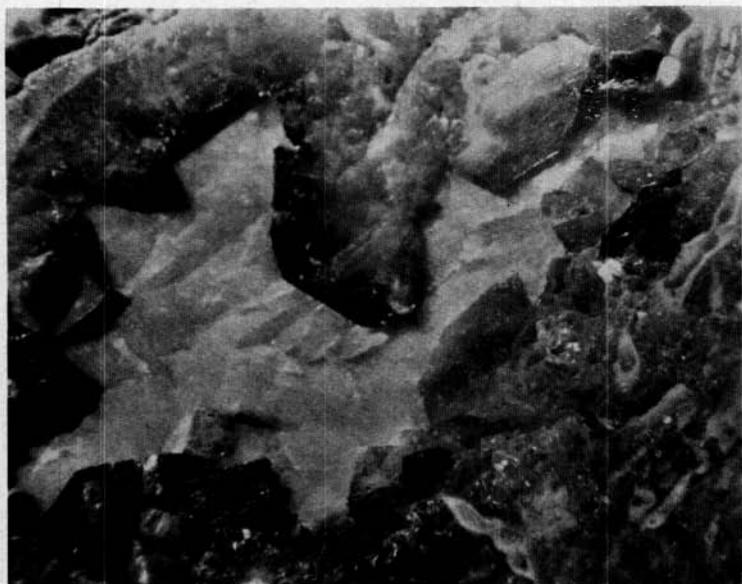


FIG. 2.—Smoothed and etched surface of a barite-filled cavity. X 10.

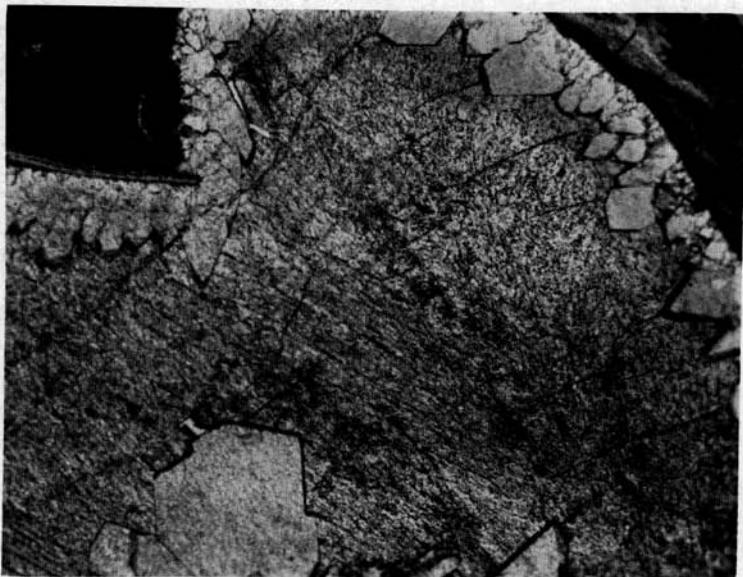


FIG. 3.—Section of a portion of a cavity lined with coarse calcite and filled with barite. X 20.

contact of the barite and the coarse calcite crystals is marked by relatively dark lines caused by the coating on the calcite previously mentioned.

The figures show two and possibly three stages of cavity filling. During the first the clear calcite of relatively small crystal size was formed on the cavity walls, followed by coarser and more euhedral crystalline calcite which appears dark. Lack of a clearly defined line between the two calcites suggests continuous deposition with conditions in the latter stage favoring the growth of larger and more perfect crystals. Subsequent to their complete growth the coarse calcite crystals have been coated with a thin brown to light-brown coating

thought to be ferruginous. In some cavities this stage is absent, and the phenomenon is a local one. The barite postdates all other stages. This is indicated by the well-defined contact between the barite and the dark coarse calcite shown in figures 2 and 3, and is further borne out by the fact that some cavities contain the fine and coarsely crystalline calcite in varying amounts, but are devoid of any barite. The presence of a few calcite crystals attached to or within the barite, figures 1 and 3, might be interpreted to mean contemporaneous or penecontemporaneous deposition of the two minerals, but it is believed more likely that the calcite crystals projected from a portion of the cavity wall destroyed during preparation of the specimens for study.